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(71) Applicant(s)

Brian Dennis Marshall
7 Kents Road, Stantonbury, MILTON KEYNES, Bucks,
MK14 6BA, United Kingdom

(72) Inventor(s)

Brian Dennis Marshall

(74) Agent and/or Address for Service

A A Thornton & Co
Northumberland House, 303-306 High Holborn,
LONDON, WC1V 7LE, United Kingdom

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(56) Documents Cited

GB 2186069 A DE 002526819 A1 DE 002406634 A
US 4634872 A

(58) Field of Search

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INT CL⁵ G07D 7/00

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(54) Document validator

(57) Apparatus for identifying counterfeit documents comprises a source of ultra-violet light (5) arranged to illuminate one surface of the document (2) and a source of visible light (4) arranged to illuminate the opposite surface of the document (2). The document (2) is supported on a transparent or translucent plate (1) and is viewed (arrow A) so as to observe simultaneously light passing through the document from the source (4) and any fluorescence produced by the ultra-violet source (5).

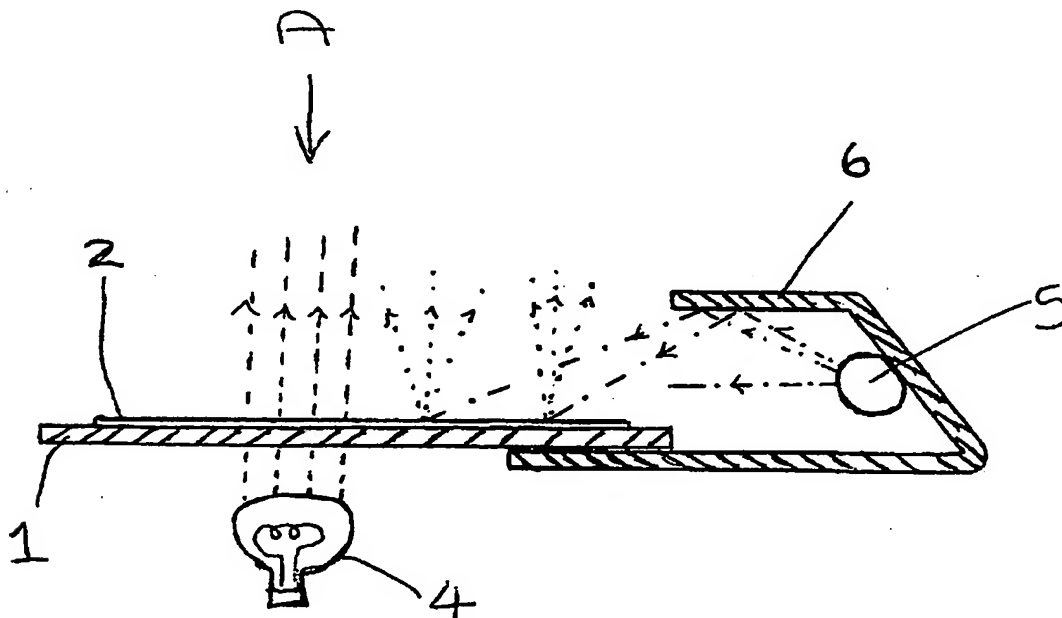


Fig. 1.

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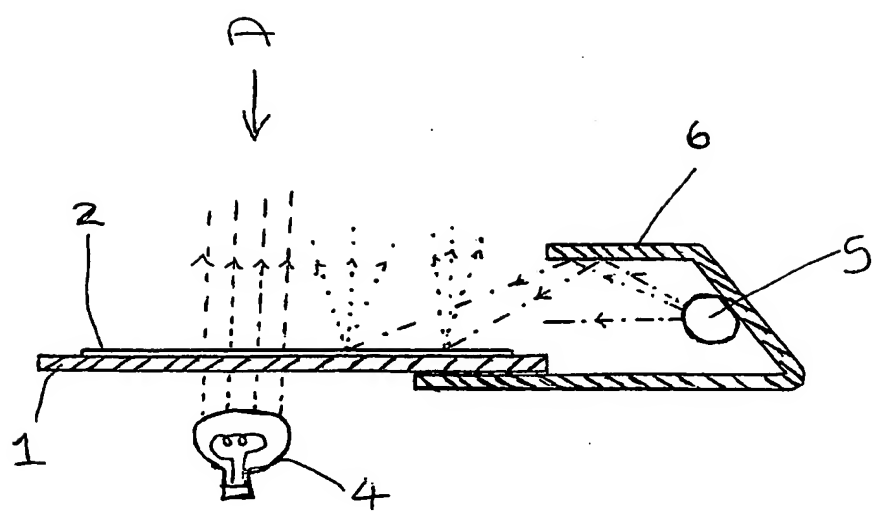


Fig. 1.

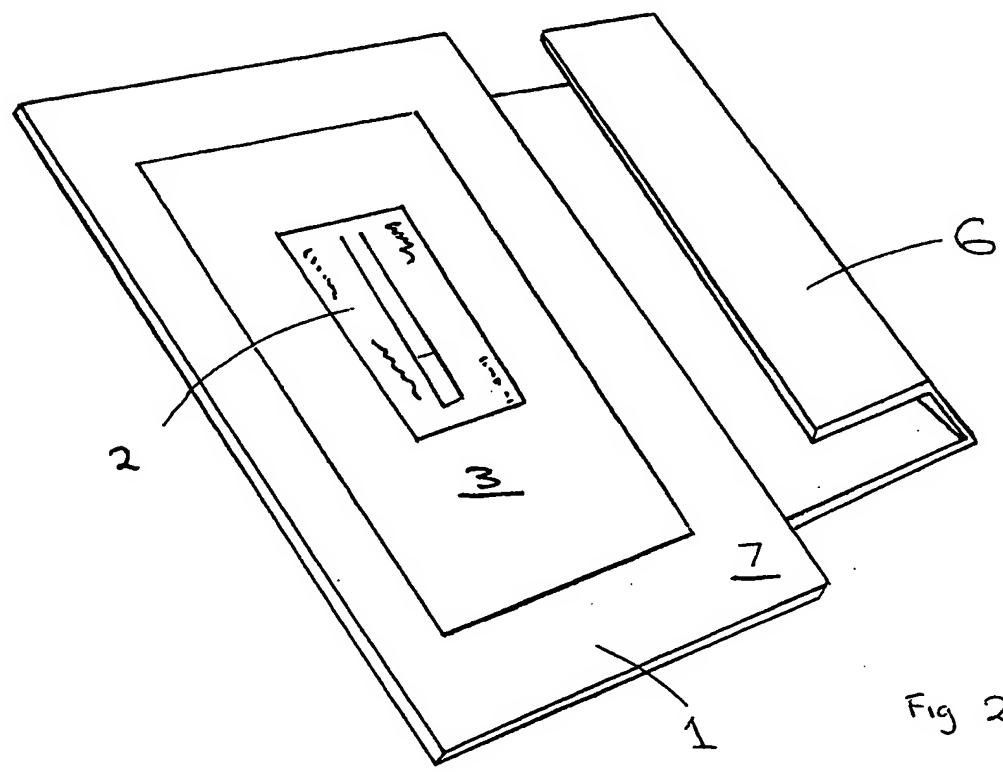


Fig 2.

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COUNTERFEIT IDENTIFICATION APPARATUS

The present invention relates to apparatus for recognising counterfeit bank notes, gift vouchers, cheques and like paper items which are exchangeable for money or money's worth.

Hitherto, bank notes, cheques, gift vouchers and other such items which are subject to forgery have been printed on a special type of paper which, unlike ordinary paper, does not fluoresce under ultra-violet light. Thus, a counterfeit bank note for example, which was not printed on such paper, could readily be identified using a source of ultra-violet (u.v.) light.

With the advent of recycling, this paper has become more widely available, particularly since banks and other financial institutions are major suppliers of paper for recycling, and this special type of paper has been used more recently to produce counterfeit bank notes which cannot be identified using a source of u.v. light. Thus, further means are required to distinguish a counterfeit bank note produced in this way from a genuine bank note.

Bank notes are provided with other features intended to make forgery difficult which are visible to the naked eye simply by holding the note up to sunlight. These include the watermark and the well known metal strip. However, holding bank notes up to a window is not practical

for the high speed checking operations which must be implemented in financial establishments. It would therefore be desirable to provide apparatus which enabled fast identification of counterfeit bank notes, cheques etc.

The preferred apparatus of the present invention includes a source of ultraviolet light and a source of visible light. Thus, the apparatus may be used to examine a bank note, for example, with the u.v. light identifying the nature of the paper and the visible light illuminating features which have been incorporated into the paper.

The apparatus preferably includes means for supporting an item to be examined. The light sources are preferably directed at opposite surfaces of the item. Thus, with a paper item, incorporated features such as the watermark can be identified from light transmitted through the paper and the nature of the paper can be determined from the fluorescence at the surface of the paper, both of which can be viewed from the same direction, preferably by the naked human eye.

In the preferred embodiment of the invention, the light sources are arranged to illuminate the item simultaneously, and the means for supporting the item may comprise a transparent or translucent plate, through which the visible light is directed.

In apparatus in which the item is to be viewed by the naked eye, the u.v. source is preferably shielded and the shield preferably has a reflective surface to reflect the u.v. light.

Alternatively, apparatus according to the invention may be incorporated in a system for conveying paper items in which case the two light sources could be offset with respect to one another.

Apparatus according to the invention may be constructed in any size depending on the number of items to

be examined. The light sources may be mains powered or energised by battery.

Embodiments of the invention will now be described by way of example only and with reference to the accompanying drawings in which:

FIGURE 1 is a schematic vertical cross-section through an embodiment of apparatus according to the invention; and

FIGURE 2 is a perspective view of the apparatus of Figure 1, from above and one side.

The illustrated apparatus includes a platen 1, which is shown supporting a cheque 2 to be examined. The central area of the platen 3 is transparent or translucent and underneath it a visible light source 4 is positioned. The visible light passes through the platen 1 and the cheque 2 as shown by the dashed lines. The visible light source 4 may be an ordinary "white" light bulb as shown.

A source of ultraviolet light 5, possibly in the form of a strip light, is positioned at the side of the platen, at a level slightly above the platen surface, and is provided with a reflective shield 6 arranged to reflect at least some of the u.v. light onto the upper surface of the cheque 2. The direction of travel of the u.v. light is indicated by the dot-dashed lines. If the cheque is an inferior forgery as shown, particles in its upper surface will fluoresce under the effect of the u.v. light and emit radiation in the direction of the dotted lines.

Using this apparatus, features such as watermarks, as well as any fluorescence, can be viewed by a detector such as the naked eye looking onto the platen as shown by arrow A.

The illustrated apparatus shows the u.v. light source and the visible light source being arranged to illuminate the cheque simultaneously. In this case, the relative intensities of the sources and their respective

optical distances from the platen must be chosen so that the fluorescence is detectable in the presence of the visible light. If the visible light is too intense with respect to the ultraviolet light, the fluorescence may become invisible to the naked eye, for example.

The u.v. source and the visible source may be connected in series in an electrical circuit so that they may be switched on and off simultaneously, or they may be separately switchable.

The illustrated apparatus may be incorporated in a small portable unit or into a piece of furniture such as a desk. In the latter case, the platen may occupy some or all of the surface of a desk or table, depending on the quantity of items to be examined. With either of these arrangements, the power supply circuitry for the light sources may include a remote switch, to be operated by the user's foot whilst seated at a desk, for example.

It will be appreciated that apparatus according to the invention may be used in the same way as existing u.v. type counterfeit recognition apparatus to examine such features as impregnated u.v. ink which is used on credit cards as well as bank notes and the like.

Apparatus according to the invention may be constructed to use very little power. An example for examining one bank note at a time would only require a 4 watt visible light bulb and a 4 watt u.v. source.

Referring again to the drawings, the shield 6 may be made primarily of metal and the platen 2 may be perspex (R.T.M.) such as COPEX (^{R.T.M.}~~trade mark~~) with an outer area 7 covered with an opaque material.

CLAIMS:

1. Apparatus for assisting in the identification of counterfeit documents comprising a source of ultra-violet light and a source of visible light mounted on a self-contained unit and positioned to enable the document to be viewed using both the ultra-violet light and the visible light.
2. Apparatus according to claim 1 wherein the light sources are arranged directed at opposite surfaces of the document.
3. Apparatus according to claim 1 or claim 2 wherein the light sources are arranged such that one surface of the document is illuminated with ultra-violet in a manner enabling the illuminated surface to be viewed from a point of observation and the source of visible light is arranged on the side of the document remote from the point of observation whereby visible light passing through the document from the source of visible light may be viewed from the same point of observation.
4. Apparatus according to claim 3 wherein a transparent or translucent support plate is located to support the document when located for illumination by the sources of ultra-violet and visible light.
5. Apparatus according to claim 3 or claim 4 wherein the source of ultra-violet light is shielded so that it cannot be directly observed from the point of observation.
6. Apparatus according to claim 1 incorporating means for conveying documents from an in-feed point to an out-feed point on the apparatus, the light sources being arranged off-set from each other along the path of the document from the in-feed point to the out-feed point.

7. Apparatus according to any preceding claim wherein the light sources may be energized from a battery whereby the apparatus forms a self-powered system which can be operated without connection to an external power supply.

8. Apparatus for assisting in the identification of counterfeit documents substantially as hereinbefore described with reference to the accompanying drawings.

Relevant Technical Fields

(i) UK Cl (Ed.L) G4X (X6) F4R (RAG)

(ii) Int Cl (Ed.5) G07D 7/00

Search Examiner
 G NICHOLLS

Date of completion of Search
 22 November 1993

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ONLINE DATABASE: WPI

Documents considered relevant following a search in respect of Claims :-
 1-8

Categories of documents

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| Y: Document indicating lack of inventive step if combined with one or more other documents of the same category. | E: Patent document published on or after, but with priority date earlier than, the filing date of the present application. |
| A: Document indicating technological background and/or state of the art. | &: Member of the same patent family; corresponding document. |

Category	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2186069 A (LINOLITE) - whole document	1-5
X	US 4634872 (JANUS) - whole document	1,5
X	DE 2526819 A1 (OLDENBOURG) - whole document especially Figure 1	1-5
X	DE 2406634 A (OLDENBOURG) - whole document	1

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